CYBOX RT 3-W

RAILWAY ROUTER WITH 5G AND WI-FI 5 WAVE 2

KEY FEATURES

- Up to two 5G interfaces for channel-bundled WAN access
- Up to 4 SIM cards for each 5G interface
- Optional Wave 2 interface with 4x4 MU-MIMO with up to 1733 Mbps
- Dual 1 Gigabit Ethernet on M12 X-coded connectors
- Optional high-speed Ethernet 10 GBaseT optical
- Optional bypass relays
- Power over Ethernet (PoE+) according to IEEE 802.3at
- Ultra-wide-range power supply 24 to 110 VDC
- Integrated GNSS
- Built-in cyber security
- Maintenance-free design
- -40 °C to +70 °C operating temperature
- EN 50155 compliant

TYPICAL APPLICATIONS

- Passenger Wi-Fi
- Passenger Entertainment
- Passenger Information
- Train-to-Ground Communication

HIGH-END WIRELESS COMMUNICATION

The CyBox RT 3-W is a member of the CyBox family – robust wireless communication routers for railway applications. It offers stable, secure, and broadband 5G/LTE connections for train-to ground communication and high-speed internet. The device hosts up to two 5G interfaces for parallel 5G channel use and thus maximized throughput or one Wave 2 interface combined with an 5G interface to boost network efficiency and connect to client devices such as mobile phones. Country-specific 5G/LTE/Wi-Fi standards are adopted for worldwide use in every type of train.

BACKBONE CONNECTIVITY

On the fixed network side, the access point features two 1 Gigabit Ethernet ports and higher bandwidth options to create a faster backbone. The fiber optic option mainly addresses new infrastructures. The bypass relay option ensures a high-speed connection even if the router is powered down.

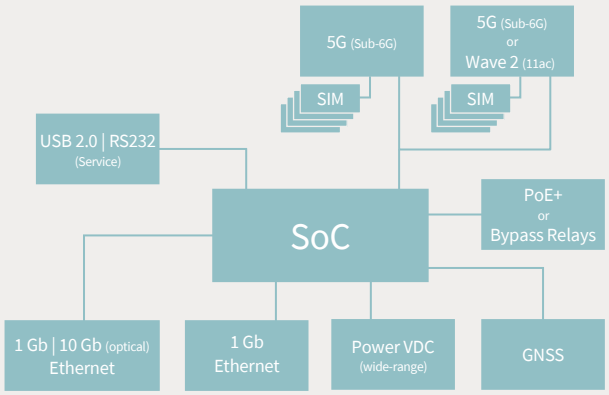
MULTIPLE POWER OPTIONS

The CyBox RT 3-W provides flexible powering options by either an internal power supply or Power-over-Ethernet (PoE+). The PoE daisy chaining offers wireless connectivity with two routers using just one cable – a noticeable cost saving factor especially in retrofit programs.

USER-INTERFACE AND SECURITY FEATURES

The CyBox RT 3-W firmware provides a convenient management interface via a web service. Besides global setup parameters the open source software OpenWrt allows the configuration of the radio interfaces, including provider information and the login dialog, as well as the setup of the stateful firewall. The access point and router configurations as well as the management firmware can be updated remotely. Furthermore, the built-in fully configurable stateful firewall and multi-VPN support with hardware-accelerated encryption ensures communication security.

BLOCK DIAGRAM



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TECHNICAL DATA

PHYSICAL INTERFACES	
System Architecture	Dual-Core CPU T1023, 1200 MHz 1 GB RAM, 128 MB Flash
Software	Linux OS OpenWrt
Antenna	QLS connectors
LAN	1 GBaseT M12 X-coded or 10 GBaseT SFP optical
USB/Serial Port	M12 8-pin female A-coded, USB 2.0, RS232
Power Input	M12 4-pin male A-coded
Reset Switch	available on front panel

ELECTRICAL SPECIFICATIONS	
Power Supply	24 to 110 VDC, wide-range power supply (compliant to EN 50155)
Power over Ethernet	PoE+, Class-4 powered device, IEEE 802.3at
Interruptions of Voltage Supply	EN 50155, Class S2
Power Consumption	20 W typ., 25 W max.

ENVIRONMENTAL CONDITIONS	
Ambient Temperature	depending on temperature class of Wi-Fi module Class OT4, -40.. +70 °C (85 °C) operating or Class OT3, -25.. +70 °C (85 °C) operating -40.. +85 °C storage
Humidity	max. 95 % non-condensing operating and storage
Altitude	Class AX, up to +2000 m
PCB Protection	conformal coating

RELIABILITY	
MTBF	approx. ~260.000 h

MECHANICAL SPECIFICATIONS	
Dimensions	105 (130) mm x 70 mm x 204 mm (w h d) (incl. mounting points)
Weight	up to 1850 g
Housing	IP40, aluminum, wall-mount, conductive cooling

MODULES

5G INTERFACE	
Transfer Rates	up to 2.4 Gbps download / 500 Mbps upload
5G	n1, n2, n3, n5, n7, n8, n12, n20, n28, n38, n40, n41, n48, n66, n71, n77, n78, n79
4G (LTE) Bands	B1, B2, B3, B4, B5, B7, B8, B12, B13, B14, B17, B18, B19, B20, B25, B26, B28, B29, B30, B32, B34, B38, B39, B40, B41, B42, B43, B48, B66, B71
3G Bands	B1, B2, B3, B4, B5, B8
Antenna	4x RF antennas, with Diversity and Massive-MIMO

WI-FI INTERFACE IEEE 802.11 a/b/g/n/ac/ac Wave 2	
Transfer Rates	up to 1733 Mbps
Frequency Range	2.412 GHz to 2.484 GHz, or 5.180 GHz to 5.825 GHz, selectable band
RF	4x RF antennas, 4x4 MU-MIMO technology
Encryption	AES, TKIP, WPA, WPA2, WPA3
Operational Feature	up to 256 clients per radio
Security	stateful firewall with multi-level client isolation

GNSS INTERFACE	
Frequency Band	GPS (L1), GLONASS (L1, FDMA), Galileo (E1) ready, Beidou, QZSS constellations
Protocol Standards	NMEA, RTCM 104
Accuracy	up to 1.5 m
Time To First Fix	cold start < 35 s, warm start 1 s

STANDARDS AND SPECIFICATIONS

Directive (EU) 2016/797	EN 50155 (IEC 60571)
	EN 45545-2 (HL 1 to HL 3)
	EN 61373 (Category 1, Class B)
RED – 2014/53/EU	EMC
	radio spectrum
	health & safety

OPTIONS

Modules	various combinations of Wi-Fi and 5G/LTE modules
Antenna Connectors	QLS to SMA adapter
Order numbers on standard configuration sheet and www.eltec.com	

EVALUATION KIT

ORDER NO.	DESCRIPTION
EVRTW-3011V0	based on model CYRTW-3011V0
	2x 5G, 2x 1 Gb ETH (M12X), PoE+, GNSS
All kits incl. antennas, adapters, cables and power supply in ruggadized suitcase	

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